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Proceedings of the 2014 Regional Peer Review Meeting for the Assessment of Striped Shrimp (*Pandalus montagui*) in Shrimp Fishing Area 4

January 23, 2014
St. John's, Newfoundland and Labrador

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Foreword

The purpose of these Proceedings is to document the activities and key discussions of the meeting. The Proceedings may include research recommendations, uncertainties, and the rationale for decisions made during the meeting. Proceedings may also document when data, analyses or interpretations were reviewed and rejected on scientific grounds, including the reason(s) for rejection. As such, interpretations and opinions presented in this report individually may be factually incorrect or misleading, but are included to record as faithfully as possible what was considered at the meeting. No statements are to be taken as reflecting the conclusions of the meeting unless they are clearly identified as such. Moreover, further review may result in a change of conclusions where additional information was identified as relevant to the topics being considered, but not available in the timeframe of the meeting. In the rare case when there are formal dissenting views, these are also archived as Annexes to the Proceedings.

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TABLE OF CONTENTS

SUMMARY iv
SOMMAIRE v
INTRODUCTION 1
PRESENTATION 1
DISCUSSION 2
- Bycatch 2
- Exploitation Rate 2
- Seasonality and Survey Timing 3
- Survey Reliability 3
- Female Spawning Stock Biomass (SSB) and Boundaries 3
- Fishery Considerations 3
- Conclusions 4

APPENDIX I 5
APPENDIX II 6
APPENDIX III 7

SUMMARY

A Canadian Science Advisory Secretariat (CSAS) regional peer review meeting was held in St. John's, Newfoundland and Labrador (NL) on January 23, 2014 to assess the status of Striped Shrimp (*Pandalus montagui*) in Shrimp Fishing Area (SFA) 4. The meeting was developed to inform management measures for the 2014-15 shrimp fishing season and to determine whether additional management considerations would be required in the future for the management of Striped Shrimp. Striped Shrimp was last assessed within SFA 4 in 2003. This species has been taken as bycatch within the Northern Shrimp (*Pandalus borealis*) commercial fishery since 1988; and has recently been assigned a bycatch limit of 4033 t in SFA 4. The objectives of this review meeting were:

1. to determine female spawning stock biomass (SSB) of Striped Shrimp in SFA 4; and;
2. to calculate the exploitation rate for Striped Shrimp in SFA 4.

Participants at the meeting included representatives from Fisheries and Oceans Canada (DFO) Science and Fisheries Management Branches, the Province of Newfoundland and Labrador - Department of Fisheries and Aquaculture (DFA), Government of Nunavut - Department of Environment, Nunatsiavut Government, Torngat Joint Fisheries Board, and industry representatives.

The meeting began with an overview of the CSAS science advisory process and a review of the terms of reference (TOR) for the meeting. Following this, one formal presentation was given: An assessment of Striped Shrimp (*Pandalus montagui*) in SFA 4 (NAFO Div. 2G) 2005-13. The main discussion topics that emerged from the presentation included: the regulations set on Striped Shrimp bycatch as a percentage over the season; the distribution of Striped Shrimp catch in relation to the distribution of fishing effort throughout SFA 4 and impacts of this on the validity of the exploitation rate index; the likely effects of strong currents on movement of Striped Shrimp and implications on calculations of spawning stock biomass; assessment of the sustainability of the interim total allowable catch; the value of Striped Shrimp compared to Northern Shrimp; concerns with the potential effects of a change in vessel during survey years; and other sources of uncertainty for the science advisory report.

Compte rendu de la réunion régionale d'examen par les pairs de 2014 pour l'évaluation de la crevette ésope (*Pandalus montagui*) dans la ZPC 4

SOMMAIRE

Le 23 janvier 2014, une réunion régionale d'examen par les pairs du Secrétariat canadien de consultation scientifique (SCCS) a eu lieu à St. John's (Terre-Neuve-et-Labrador) pour évaluer l'état de la crevette ésope (*Pandalus montagui*) dans la zone de pêche de la crevette (ZPC) 4. La réunion visait à éclairer les mesures de gestion pour la saison de pêche de la crevette de 2014-2015 et à déterminer si d'autres considérations liées à la gestion seraient nécessaires à l'avenir pour gérer la crevette ésope. La crevette ésope dans la ZPC 4 a été évaluée pour la dernière fois en 2003. Cette espèce est une prise accessoire dans la pêche commerciale de la crevette nordique (*Pandalus borealis*) depuis 1988, et sa limite de prises accessoires a récemment été fixée à 4 033 t dans la ZPC 4. Les objectifs de cette réunion d'examen sont les suivants :

1. déterminer la biomasse du stock reproducteur (BSR) femelle de la crevette ésope dans la ZPC 4; et
2. déterminer le taux d'exploitation de la crevette ésope dans la ZPC 4.

Les participants à la réunion comprennent des représentants de la Direction des sciences et de la Direction de la gestion des pêches de Pêches et Océans Canada (MPO), du ministère des Pêches et de l'Aquaculture de Terre-Neuve-et-Labrador, du ministère de l'Environnement du Nunavut, du gouvernement du Nunatsiavut, de l'Office Torngat mixte des pêches, et de l'industrie.

La réunion commence par un aperçu du processus d'avis scientifique du SCCS et un examen du cadre de référence de la réunion. On donne ensuite une présentation officielle sur une évaluation de la crevette ésope (*Pandalus montagui*) dans la ZPC 4 (division 4G de l'Organisation des pêches de l'Atlantique Nord-Ouest [OPANO]) de 2005 à 2013. Les principaux sujets de discussion qui ressortent de la présentation comprennent : la réglementation sur les prises accessoires de crevette ésope en tant que pourcentage au cours de la saison; la répartition des prises de crevette ésope par rapport à la répartition de l'effort de pêche dans l'ensemble de la ZPC 4 et ses répercussions sur la validité de l'indice du taux d'exploitation; les effets probables des forts courants sur le mouvement de la crevette ésope et l'incidence sur les calculs de la biomasse du stock reproducteur; l'évaluation de la durabilité du total autorisé des captures provisoire; la valeur de la crevette ésope par rapport à la crevette nordique; les préoccupations concernant les effets possibles d'un changement de navire dans les années de relevés; et les autres sources d'incertitude pour l'avis scientifique.

INTRODUCTION

Fisheries and Oceans Canada (DFO) held a regional peer review meeting for the assessment of Striped Shrimp (*Pandalus montagui)* in shrimp fishing area (SFA) 4 on January 23, 2014 in response to DFO commitments made to review the status of this resource at a Northern Shrimp Advisory Committee (NSAC) meeting in 2013. The purpose of the peer review meeting was to update the status of Striped Shrimp to inform management considerations for the 2014-15 fishing season. Key objectives, outlined in the terms of reference (TOR; Appendix 1) for this meeting, included:

1. determination of female spawning stock biomass; and
2. calculation of the exploitation rate for Striped Shrimp in SFA 4.

Publications resulting from this meeting will include a Canadian Science Advisory Secretariat (CSAS) Science Advisory Report (SAR), a CSAS Research Document and a CSAS Proceedings report.

Participants at the meeting (Appendix II) included representatives from DFO Science and Fisheries Management Branches, the Province of Newfoundland and Labrador Department of Fisheries and Aquaculture (DFA), Government of Nunavut Department of Environment, Nunatsiavut Government, Torngat Joint Fisheries Board, and industry.

After a round of introductions, the chair gave a brief presentation of the DFO science advisory process followed by an outline of the terms of reference (TOR) for the meeting. Subsequently, one formal presentation was given: An assessment of Striped Shrimp (*Pandalus montagui*) in Shrimp Fishing Area 4 (NAFO Div. 2G) 2005-13.

PRESENTATION

An Assessment of Striped Shrimp (*Pandalus montagui*) in SFA 4 (NAFO Div. 2G) 2005-13

Authors: David Orr and Katherine Skanes

Presenter: Katherine Skanes

Summary

Striped Shrimp (*P. montagui*) are found over a wide area. The preferred temperature for Striped Shrimp is usually below 1°C. Temperatures above 1°C tend to be preferred by Northern Shrimp (*P. borealis*) and there exists an intermediary between 1-2°C where both species tend to overlap. Bottom temperature plots in the area of SFA 4 (2005-13) show that temperatures generally increase with depth, and in recent years (e.g., 2011) have increased before cooling off again. In the area of SFA 4 the areas below 1°C are the inshore areas at the northern end of the SFA and are where the Striped Shrimp catches are largely being taken.

Striped Shrimp is surveyed in the annual joint Northern Shrimp Research Foundation (NSRF)-DFO bottom trawl surveys that began in July, 2005. Most of the fishable biomass is female. Relative to SFA 4, Striped Shrimp are also found to the North in the Western and Eastern Assessment Zones. Notably, these areas have strong ocean currents and tides that likely move the shrimp in and out of SFA 4 at an unknown rate.

Striped Shrimp are taken mainly as bycatch in the Northern Shrimp fishery. Most of the Striped Shrimp commercial catch is taken in clusters north of 60°N at depths from 100-300 m. Over the years, most survey catches were taken from various latitudes at depths less than 300 m. Commercial catch from 2001-12 is taken from logbooks and is based on a calendar year; while

catch in 2013-14 is taken from Canadian Atlantic Quota Report (CAQR – updated January 21) and is based on a management year of April 1, 2013 to March 31, 2014. As such, 2013-14 data is preliminary (as of January 21, 2014) not all data are yet available.

A bycatch limit for Striped Shrimp was set for the first time 2013 at 4033 t. The 2013-14 catch to January 21, 2014 from the CAQR is listed at 1850 t – which is less than half of the 2013-14 bycatch limit. The exploitation rate index is based on the total catch/ fishable biomass index and is expressed as a percentage. The 2013-14 estimate is preliminary as Striped Shrimp can still be taken as bycatch within the ongoing Northern Shrimp fishery.

DISCUSSION

BYCATCH

Clarification was requested as to how bycatch limits have been addressed by industry. Insight from active participants in the fishery indicated that the 4033 t bycatch limit was divided informally within the fleet into tonnes/license. An informal agreement existed such that bycatch levels remain below 50 % per trip (7 day period) until 90 % of the bycatch limit is caught. Fleets would then have to revert to 10 % per trip. This informal strategy for dealing with the Striped Shrimp bycatch limit came from apparent formalized rules that existed previously in an old system in the inshore Nunavut settlement area (Area 3). These assertions were supported by DFO resource managers and confirmed industry's views.

EXPLOITATION RATE

Concern was expressed about the validly of the exploitation rate index for this SFA. Plots of fishing positions from logbook data show that the fishery is localized in the northern part of the SFA, while the biomass is distributed throughout the whole of SFA 4. This observation led to the question of whether or not a valid index of relative exploitation on this stock is available. In response it was noted that the calculation of exploitation rate is as valid in SFA 4 as it is for any other areas; Striped Shrimp is not the only species where catch over biomass is used as a measure of exploitation. One participant also noted that the Striped Shrimp fishery is not separate from the Northern Shrimp fishery, but rather occur simultaneously. The area shown on the plots is simply indicative of where the largest catches of Striped Shrimp occurred. Catches also likely occurred in other areas, but were so low that they were not represented in the figures. Notably, if the catch in a commercial set is less than 15 % Striped Shrimp, the catch is recorded as Northern Shrimp.

To address the concerns on exploitation rate it was suggested that the exploitation rate index would be more representative if the fishing effort was more broadly distributed. As it was unclear whether true zeros were indicated on the plots presented at the meeting, previous maps of the Striped Shrimp catch distribution were consulted from the 2013 assessment of Northern Shrimp to investigate this. From this, it was noted that Northern Shrimp catches appeared in the more southern portion of the SFA whereas this was not true for Striped Shrimp. This suggested that although the catch for Striped Shrimp is zero or low, effort was expended in the South. As such, concerns expressed regarding the exploitation rate index were addressed and somewhat alleviated.

Whether the exploitation rate index (11 %) for Striped Shrimp in SFA 4 should be placed in the context of the 20 % maximum harvest for Northern Shrimp was discussed. Some participants felt it was an appropriate context; while others expressed that it is unknown if that information is relevant for this species.

SEASONALITY AND SURVEY TIMING

There was discussion on the tides and strong currents in the area as well as the extreme seasonal nature of Striped Shrimp, and whether or not that may impact the biomass estimates from the survey. Seasonality of surveys was decided to not be a considerable effect if the survey is undertaken at the same time every year. However, there may be an offset between biological season and calendar month. This is, however, hard to take into account with surveys.

SURVEY RELIABILITY

Concern was expressed that the shrimp survey in SFA 4 was conducted with a different vessel (Cape Ballard) from 2005 to 2011 than in 2012 and 2013 (Aqviq). The survey protocol was also changed in 2012 in that the warp length was shortened. No intercalibration was conducted at that time to investigate different warp ratios effects. It is unknown what effect this had on survey results. While this change may have affected trawl performance, it is, however, presumed to be minimal. It was agreed this information should be included in the Sources of Uncertainty within the SAR.

FEMALE SPAWNING STOCK BIOMASS (SSB) AND BOUNDARIES

Concern was expressed that the term female spawning stock biomass (SSB) may be problematic in these documents because SSB is referring to the portion of the stock that spawns in SFA 4 but not necessarily to the portion whose products are eventually caught in SFA 4. This matter re-emerged often during the meeting as a frequent discussion topic. Ultimately it was agreed that SSB could not be calculated for this area – and that the term female biomass should be used in the advice instead of spawning stock biomass (although this would be inconsistant with other SARs).

From this there was discussion that it may be necessary to indicate within the SAR that there is no evidence that Striped Shrimp is a self-contained stock in SFA 4. Notably, terms such as 'decreased' and 'tripled' (within the summary bullets of the SAR) may be misleading as they do not necessarily reflect a contained population increasing and decreasing in biomass, but may actually indicate movement in and out of the SFA.

It was advised that caution be used in highlighting these issues with Striped Shrimp in SFA 4 as it may then be suggested that the same concept should be consistently applied to all SFAs (or even other stock assessment processes). Ultimately, it was agreed that while the presentation of the catch information may be factually correct, it can also be misleading in many regards in this case; therefore the issue should be addressed within Sources of Uncertainty section and in the body of the text (as opposed to within the Summary bullets of the SAR).

FISHERY CONSIDERATIONS

The question was put forward whether or not fishers can get the same price for Striped Shrimp as they get for Northern Shrimp. The general sentiment from discussions was that this is not the case. Striped Shrimp is not necessarily a desired catch but has been less actively avoided in recent years. An account of the market from an industry representative indicated there can be marketing complications if the catch is not entirely comprised of Striped Shrimp. While Striped Shrimp can support a valuable fishery on its own, it can also taint the Northern Shrimp fishery, downgrading it if it exceeds a certain percentage of the catch.

Another topic that was discussed was whether the intention of this meeting was to set a total allowable catch (TAC) for *P. montagui* in SFA 4. The bycatch limit of 4033 t for 2013-14 was set to put some control on the fishery. However, rather than to set a TAC, it was clarified that the

purpose of this meeting was to evaluate the sustainability of that limit, to determine if it worked, and to set the foundation for more options for the future. The issue of resource allocation is strictly a fishery management consideration, not to be part of the discussions during the assessment meeting.

CONCLUSIONS

It was noted that Striped Shrimp in SFA 4 was last assessed in 2003 and that it will be considered again next year as it is incorporated into the biennial assessment cycle with Northern Shrimp. Therefore, some of the conclusions put forward from this current assessment may be better served when rolled over into future assessments in order to make a stronger statement on the state of the resource.

APPENDIX I

Terms of Reference

2014 Assessment of Striped Shrimp in SFA 4 - Regional Peer Review Process - Newfoundland and Labrador Region

January 23, 2014

St. John's, NL

Chairperson: Becky Sjare

Context

Striped Shrimp (*Pandalus montagui*) were last assessed within Shrimp Fishing Area (SFA) 4 during 2003. This species has been taken as bycatch within the Northern shrimp (*Pandalus borealis*) commercial fishery since 1988, and has recently been taken as a directed species. However, unlike Northern shrimp, this species has been fished without a dedicated management plan or a Total Allowable Catch (TAC) to date.

In support of DFO commitments made at the 2013 Northern Shrimp Advisory Committee (NSAC), DFO Fisheries Management has requested an update of the status of Striped Shrimp to inform sound management recommendations for the 2014/15 shrimp fishing season. An assessment of Striped Shrimp in SFA 4 will be used in the development of an initial management plan to support a sustainable fishery – including setting an interim quota.

A CSAS Regional peer review process is planned to provide an updated assessment of Striped Shrimp to fulfill this request. It is anticipated that this portion of the Striped Shrimp resource will be fully assessed on a biennial basis with the SFAs 4-6 Northern shrimp assessment in future years.

Objectives

- To determine female spawning stock biomass (SSB) of Striped Shrimp in SFA 4.
- To calculate the exploitation rate for Striped Shrimp in SFA 4.

Expected Publications

- Science Advisory Report
- Research Document(s)
- Proceedings

Participation

- Fisheries and Oceans Canada (DFO) Science and Fisheries Management Branches
- Province of Newfoundland and Labrador Department of Fisheries and Aquaculture
- Government of Nunavut Department of Environment
- Nunavut Wildlife Management Board
- Nunavik Marine Region Wildlife Board
- Nunatsiavut Government
- Torngat Joint Fisheries Board
- Academia
- Industry

APPENDIX II

List of Participants

Name	Association
Broomfield, Todd	Nunatsiavut Government
Burke, Brian	Government of Nunavut
Butler, Derek	Assoc. Seafood Producers
Coffey, Edgar	QuinSea Fisheries
Dawe, Earl	DFO – Science (NL)
Dooley, Tom	DFA – Government of NL
Edgar, Leigh	DFO – Resource Mgmt (NCR)
Evans, Geoff	DFO – Science (NL)
Simpson, Greg	Mersey Seafoods Ltd.
Hiltz, Beth	DFO – Resource Mgmt (CA)
Johnson, Ron	Torngat Fisheries Co-Op
King, Wayne	DFO – Resource Mgmt (NL)
McNamara, Brian	Newfound Resources Ltd.
Muirhead, Bill	Mersey Seafoods Ltd.
Mullowney, Darrell R	DFO – Science (NL)
Martin, Patrick	Niqitaq Fisheries Ltd.
Rumbolt, Annette	DFO – Resource Mgmt (NL)
Sharkey, Charlotte	DFO – Resource Mgmt (CA)
Siferd, Tim	DFO – Science (CA)
Sjare, Becky	DFO – Science (NL)
Skanes, Katherine	DFO – Science (NL)
Stansbury, Don	DFO – Science (NL)
Sullivan, Darren	DFO – Science (NL)
Templeman, Nadine	DFO – Science (NL)
Neville, Victoria	Marine Institute (CFER)
Walsh, Rosalind	Northern Coalition
Ward, Jerry	Baffin Fisheries Coalition
Watts, Keith	Torngat Fisheries Co-Op
Whalen, Julie	Torngat Secretariat

APPENDIX III

Agenda

NL Regional Peer Review – Assessment of Striped Shrimp in SFA 4

January 23, 2014

Hampton Inn & Suites, St. John's, NL

Activity	Presenter
Welcome/Opening Remarks	B. Sjare (Chair)
Presentation: An Assessment of Striped Shrimp (*Pandalus montagui*) in SFA 4	K. Skanes
Discussion	All
Conclusions: SAR Summary Bullets	All
Closing/Next Steps	B. Sjare (Chair)

Note: Agenda remains fluid – BREAKS to be determined as meeting progresses.